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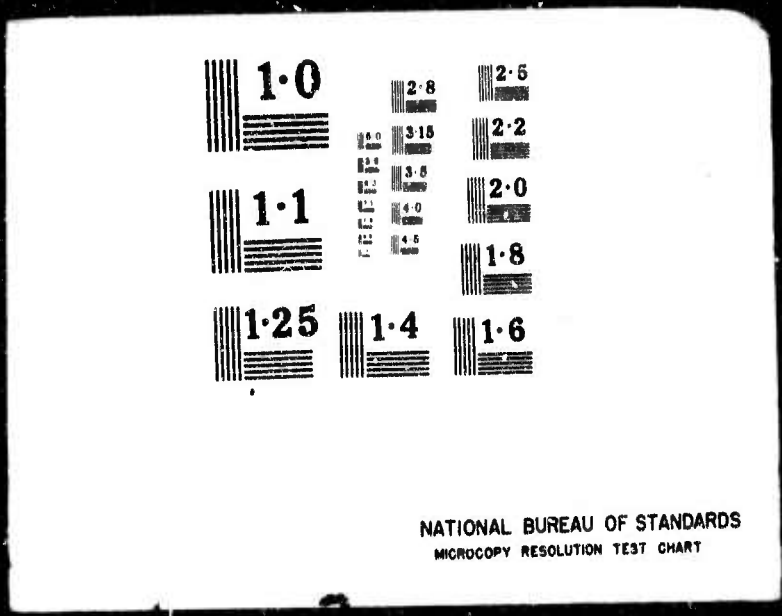
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MICROCOPY RESOLUTION TEST CHART

Geophysical Data Report

FARADAY ROTATION DATA: BANGKOK, THAILAND
Reporting period: January - June 1967

By: VICHAI T. NIMIT

Prepared for:

U.S. ARMY ELECTRONICS COMMAND
FORT MONMOUTH, NEW JERSEY

CONTRACT DA-36-039 AMC-00040(E)
ORDER NO. 5384-PM-63-91
ARPA ORDER NO. 371

SPONSORED BY THE ADVANCED RESEARCH PROJECTS AGENCY
FOR THE
THAI-U.S. MILITARY RESEARCH AND DEVELOPMENT CENTER
SUPREME COMMAND HEADQUARTERS
BANGKOK, THAILAND

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STANFORD RESEARCH INSTITUTE

MENLO PARK, CALIFORNIA

July 1967

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SRI Project 4240

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I INTRODUCTION

Faraday rotation observations are being carried out at the Electronics Laboratory of the Military Research and Development Center (MRDC) at Bangkok, Thailand, a joint Thailand-United States organization. The cooperation and participation of the staff members of the Thailand Ministry of Defense and the support of the United States Advanced Research Projects Agency and the United States Army Electronics Laboratories have made it possible for the data presented in this report to be accumulated.

The following information about the site is pertinent.

Table I

FARADAY ROTATION SITE AT BANGKOK, THAILAND

Geographic		Geomagnetic		Magnetic Dip
Latitude	Longitude	Latitude	Longitude	
13.73°N	100.57°E	2.5°N	169.83°E	10°N

II DISCUSSION

The data contained in this bulletin are experimental results obtained by analyzing Faraday rotation records obtained from the S-66 (Explorer 22) radio beacon satellite. Half-wave dipole antennas are used to receive 20-, 40-, and 41-MHz unmodulated signals.

The rotation rate technique[1]* is applied to calculate the equivalent vertical electron content from a portion of the record near the transverse position.[2,3] The electron content is calculated at the transverse position. This position corresponded to the subionospheric latitude of 14.3°N ± 0.1° and a subionospheric longitude of 101°E ± 4.0°. The electron content is determined by using the following relation:

$$\int_o^{h_s} N dh = \frac{\dot{R}}{\dot{G}} \quad , \tag{1}$$

where

$\int_o^{h_s} N dh$ = the integrated electron contents from ground to the satellite in electrons/m^2

h_s = the satellite height in kilometers

$\dot{R}$ = the rotation rate in revolutions per minute calculated by using a 1-minute interval centered at transverse position

$\dot{G}$ = the geometrical coefficient, interpolated from values furnished by the Science Research Council, Radio and Space Research Station, Slough, England in rpm/electrons/m^2, assuming the height of the peak F layer density is 300 km.

*References are given at the end of the report.

The equivalent slab thickness of the ionosphere is determined by:

$$\tau = \frac{\int_0^{h_s} N dh}{1.24 \times 10^{13} (f_o F2)^2} \qquad (2)$$

where

τ = the slab thickness in kilometers

$f_o F2$ = the critical frequency of the F layer in megahertz.

The electron content is calculated from Eq. (1), and the $f_o F2$ critical frequency of the ionosphere is obtained from scaled values from the ionosonde located at the Electronics Laboratory of the Military Research and Development Center at Bangkok.

The calculated values of electron content are plotted for ascending and descending passes, respectively. Because the satellite precessed westward, the time of the satellite passage over Bangkok became progressively earlier. The passage time moved through a 24-hour period in about five and a half months. Therefore, each calculated value of electron content is associated with a particular hour and day.

Electron Content and Equivalent Slab Thickness Evaluated from Faraday Fading Rate

Date (1967)	Revolution Number*	Transverse Position, T_o (GMT)	$\dot{R}$ (rpm)			$\dot{G}$ ($\times 10^{-16}$)	Electron Content ($\times 10^{16}$ elec/m^2)	f_oF2 (MHz)	Slab Thickness, τ (km)
			20 MHz	40 MHz	41 MHz				
1 January	11174A	0933:33		12.4		0.287	43.0	10.4	320
1 January	11180D	2046:24			1.8	0.290	6.0	4.8	210
2 January	11187A	0816:05			11.4	0.271	42.1	10.3	320
2 January	11194D	2113:39			0.90	0.289	3.1	2.7	340
4 January	11215A	0910:41			10.0	0.265	37.7	9.0	380
4 January	11221D	2023:24			1.1	0.293	3.9	4.1	190
5 January	11228A	0753:07			10.6	0.265	40.0	8.5	450
5 January	11235D	2050:43			1.4	0.294	4.8	3.5	310
6 January	11242A	0820:30			10.0	0.263	38.0	8.5	420
6 January	11248D	1933:08			1.4	0.296	4.7	4.4	200
7 January	11256A	0847:45			9.1	0.261	34.9	8.1	430
7 January	11262D	2000:23			1.3	0.296	4.5	3.6	280
8 January	11269A	0730:13			11.4	0.265	43.0	10.3	330
9 January	11289D	1910:07			2.1	0.301	6.8	5.2	200
10 January	11297A	0825:23			11.1	0.264	42.0	10.4	310
10 January	11303D	1937:22			2.8	0.305	9.0	6.8	160
11 January	11310A	0707:16			10.9	0.261	41.8	9.6	370

* The letters A and D indicate ascending and descending satellite passes, respectively.

Electron Content and Equivalent Slab Thickness Evaluated from Faraday Fading Rate

Date (1967)	Revolution Number*	Transverse Position, T_o (GMT)	$\dot{R}$ (rpm)			$\dot{G}$ ($\times 10^{-16}$)	Electron Content ($\times 10^{16}$ elec/m^2)	f_oF2 (MHz)	Slab Thickness, τ (km)
			20 MHz	40 MHz	41 MHz				
12 January	11330D	1847:05			2.2	0.305	7.0	6.3	140
13 January	11338A	0801:54			4.9	0.261	18.6	9.8	160
14 January	11351A	0644:21			7.1	0.257	27.6	8.6	300
14 January	11357D	1756:50			0.95	0.306	3.1	5.9	70
15 January	11365A	0711:38			9.0	0.257	34.8	8.4	400
16 January	11379A	0738:55			7.5	0.256	29.3	8.4	330
17 January	11392A	0621:28			7.7	0.256	30.1	8.4	340
18 January	11412D	1801:03			1.8	0.307	5.8	5.3	170
19 January	11426D	1828:19			1.7	0.306	5.6	4.6	210
20 January	11433A	0558:27			8.5	0.257	33.0	8.9	340
20 January	11439D	1710:46			1.1	0.308	3.6	4.6	140
21 January	11447A	0625:48			9.8	0.254	38.6	7.9	500
21 January	11453D	1737:54			3.4	0.312	10.9	7.0	180
22 January	11461A	0652:57			9.2	0.254	36.2	8.5	400
22 January	11467D	1805:10			1.9	0.309	6.0	5.3	170
23 January	11474A	0535:34			11.1	0.256	43.3	9.1	420
23 January	11480D	1647:36			3.3	0.313	10.5	7.2	160

* The letters A and D indicate ascending and descending satellite passes, respectively.

Electron Content and Equivalent Slab Thickness Evaluated from Faraday Fading Rate

Date (1967)	Revolution Number*	Transverse Position, T_o (GMT)	$\dot{R}$ (rps)			$\dot{G}$ ($\times 10^{-16}$)	Electron Content ($\times 10^{16}$ elec/m^2)	f_oF2 (MHz)	Slab Thickness, τ (km)
			20 MHz	40 MHz	41 MHz				
24 January	11494D	1714:51			3.7	0.312	11.7	6.7	210
25 January	11502A	0629:59			9.9	0.257	38.6	9.6	340
25 January	11508D	1742:10			4.6	0.313	14.8	6.9	250
26 January	11515A	0512:38			11.8	0.262	44.9	11.4	280
26 January	11521D	1624:34			3.9	0.315	12.4	8.3	140
27 January	11529A	0539:50			10.2	0.254	40.2	8.7	430
28 January	11549D	1719.06			6.5	0.314	20.7	8.4	240
29 January	11556A	0449:37			11.5	0.255	44.9	9.1	440
29 January	11562D	1601:32			6.2	0.315	19.6	8.6	210
30 January	11570A	0517:02		12.5		0.268	46.6	8.9	470
31 January	11584A	0544:05			10.0	0.254	39.4	8.7	420

* The letters A and D indicate ascending and descending satellite passes, respectively.

Electron Content and Equivalent Slab Thickness Evaluated from Faraday Fading Rate

Date (1967)	Revolution Number*	Transverse Position, T_o (GMT)	$\dot{R}$ (rpm)			$\dot{G}$ ($\times 10^{-16}$)	Electron Content ($\times 10^{16}$ elec/m^2)	f_oF2 (MHz)	Slab Thickness, τ (km)
			20 MHz	40 MHz	41 MHz				
1 February	11597A	0426:35			11.5	0.257	44.9	9.8	380
3 February	11625A	0521:06			10.4	0.257	40.4	9.4	370
3 February	11631D	1632:58			6.3	0.315	20.0	8.7	210
4 February	11638A	0404:50			13.0	0.263	49.2	11.3	320
5 February	11652A	0430:55			13.0	0.268	48.5	12.2	260
6 February	11666A	0458:28			13.2	0.263	50.2	10.5	370
6 February	11672D	1609:54			8.1	0.313	25.9	8.5	290
7 February	11679A	0340:39			13.7	0.274	50.0	13.6	220
8 February	11693A	0407:55			13.4	0.273	49.1	13.1	230
8 February	11699D	1520:06			10.7	0.314	34.0	9.8	290
9 February	11707A	0435:10			11.2	0.260	43.0	9.3	400
10 February	11720A	0317:42			12.1	0.267	46.8	10.7	330
11 February	11734A	0344:57			11.3	0.261	43.4	9.1	420
11 February	11740D	1457:04			10.6	0.313	33.9	10.8	230
12 February	11748A	0412:08			11.5	0.266	43.2	10.5	320
13 February	11761A	0255:06			10.1	0.270	37.3	11.2	240
13 February	11767D	1406:08			8.0	0.308	26.1	9.8	220

* The letters A and D indicate ascending and descending satellite passes, respectively.

Electron Content and Equivalent Slab Thickness Evaluated from Faraday Fading Rate

Date (1967)	Revolution Number*	Transverse Position, T_o (GMT)	$\dot{R}$ (rpm)			$\dot{G}$ ($\times 10^{-16}$)	Electron Content ($\times 10^{16}$ elec/m^2)	f_oF2 (MHz)	Slab Thickness, τ (km)
			20 MHz	40 MHz	41 MHz				
14 February	11781D	1432:23			11.2	0.304	36.9	9.0	370
15 February	11788A	0204:23			8.2	0.271	30.3	10.9	210
16 February	11802A	0231:40			9.8	0.269	36.4	9.8	310
16 February	11808D	1343:02			8.5	0.302	28.1	9.4	260
17 February	11816A	0258:55			11.7	0.270	43.3	10.2	340
17 February	11822D	1411:05			5.7	0.300	19.0	9.4	170
18 February	11829A	0141:22			8.8	0.269	32.9	9.0	330
19 February	11849D	1319:53			6.3	0.295	21.4	8.5	240
20 February	11857A	0235:52			10.3	0.276	37.3	11.1	240
20 February	11863D	1348:04			5.5	0.295	18.6	9.1	180
21 February	11870A	0118:20			7.5	0.275	27.3	10.1	220
21 February	11877D	1414:31			10.5	0.295	35.6	9.4	330
22 February	11884A	0146:13			8.7	0.276	31.5	10.7	220
22 February	11890D	1257:18			6.1	0.293	20.8	8.8	220
23 February	11898A	0212:50			11.1	0.279	39.7	11.6	230
23 February	11904D	1325:00			9.3	0.290	32.1	8.5	360
24 February	11912A	0240:58			10.7	0.277	38.6	10.1	300

* The letters A and D indicate ascending and descending satellite passes, respectively.

Electron Content and Equivalent Slab Thickness Evaluated from Faraday Fading Rate

Date (1967)	Revolution Number*	Transverse Position, T_o (GMT)	$\dot{R}$ (rpm)			$\dot{G}$ ($\times 10^{-16}$)	Electron Content ($\times 10^{16}$ elec/m^2)	f_oF2 (MHz)	Slab Thickness, τ (km)
			20 MHz	40 MHz	41 MHz				
25 February	11925A	0122:36			8.6	0.279	30.8	10.8	210
25 February	11931D	1233:46			9.1	0.295	31.2	12.1	170
26 February	11939A	0149:47			9.7	0.283	34.3	11.7	200
27 February	11952A	0031:55			6.1	0.275	22.2	7.8	290
28 February	11966A	0100:17			7.4	0.278	26.6	9.3	250
28 February	11972D	1211:46			4.3	0.282	15.1	8.0	190

* The letters A and D indicate ascending and descending satellite passes, respectively.

Electron Content and Equivalent Slab Thickness Evaluated from Faraday Fading Rate

Date (1967)	Revolution Number*	Transverse Position, T_o (GMT)	$\dot{R}$ (rps)			$\dot{G}$ ($\times 10^{-16}$)	Electron Content ($\times 10^{16}$ elec/m^2)	f_oF2 (MHz)	Slab Thickness, τ (km)
			20 MHz	40 MHz	41 MHz				
1 March	11980A	0126:46			8.2	0.283	29.0	10.6	210
1 March	11986D	1238:29			8.5	0.283	30.0	9.0	300
2 March	11993A	0009:16			5.4	0.277	19.3	8.0	240
2 March	12000D	1305:43			6.1	0.279	21.7	8.3	250
3 March	12007A	0036:31			6.8	0.282	24.1	9.4	220
4 March	12021A	0103:42			8.0	0.287	27.9	10.6	200
4 March	12027D	1215:25		9.0		0.293	30.8	8.5	340
4 March	12034A	2346:14			4.2	0.279	15.1	6.8	260
5 March	12041D	1242:11			8.0	0.276	29.0	8.7	310
6 March	12048A	0013:42			6.0	0.286	21.0	8.9	210
6 March	12054D	1124:36			15.0	0.276	54.4	8.9	550
7 March	12062A	0040:35			7.2	0.290	24.7	10.0	200
9 March	12095D	1101:35			12.9	0.295	43.7	10.0	350
10 March	12103A	0017:33			6.5	0.291	22.3	7.3	340
10 March	12109D	1128:51			14.5	0.273	53.1	9.5	470
10 March	12116A	2300:23			2.0	0.283	6.9	4.5	270
11 March	12123D	1156:09			12.7	0.276	46.0	11.2	300

* The letters A and D indicate ascending and descending satellite passes, respectively.

Electron Content and Equivalent Slab Thickness Evaluated from Faraday Fading Rate

Date (1967)	Revolution Number*	Transverse Position, T_o (GMT)	$\dot{R}$ (rpm)			$\bar{G}$ ($\times 10^{-16}$)	Electron Content ($\times 10^{16}$ elec/m^2)	f_oF2 (MHz)	Slab Thickness, τ (km)
			20 MHz	40 MHz	41 MHz				
11 March	12130A	2327:37			2.0	0.285	6.8	5.0	220
12 March	12136D	1038:34			16.0	0.277	57.7	11.9	330
13 March	12150D	1105:49			15.4	0.274	56.4	11.3	360
13 March	12157A	2237:20			1.9	0.289	6.4	4.4	270
14 March	12164D	1133:31			14.7	0.270	54.5	10.2	420
15 March	12177D	1015:31			14.8	0.312	47.5	12.9	230
15 March	12185A	2331:50			1.4	0.292	4.8	5.0	150
16 March	12191D	1142:45			14.0	0.269	52.0	10.7	370
17 March	12212A	2241:13			1.8	0.295	5.9	4.4	250
18 March	12218D	0952:30			14.6	0.271	53.9	11.9	310
18 March	12226A	2308:47			1.2	0.296	3.9	4.4	160
19 March	12232D	1019:43			14.4	0.265	54.3	10.6	390
19 March	12239A	2150:46			3.4	0.299	11.4	5.6	290
20 March	12246D	1147:03			14.1	0.263	55.1	10.4	410
20 March	12253A	2218:29			4.9	0.303	16.2	7.1	260
21 March	12259D	0929:25			17.0	0.270	62.9	12.4	330
21 March	12267A	2245:23			1.4	0.300	4.7	4.5	190

* The letters A and D indicate ascending and descending satellite passes, respectively.

Electron Content and Equivalent Slab Thickness Evaluated from Faraday Fading Rate

Date (1967)	Revolution Number*	Transverse Position, T_o (GMT)	$\dot{R}$ (rpm)			$\dot{G}$ ($\times 10^{-16}$)	Electron Content ($\times 10^{16}$ elec/m^2)	f_oF2 (MHz)	Slab Thickness, τ (km)
			20 MHz	40 MHz	41 MHz				
22 March	12273D	0956:40			15.4	0.266	57.9	11.4	360
22 March	12280A	2127:49			2.8	0.302	9.3	5.1	290
23 March	12287D	1024:08			13.8	0.265	52.2	11.3	330
24 March	12300D	0906:38			17.0	0.265	64.2	11.5	390
24 March	12308A	2222:18			2.4	0.305	7.9	4.9	270
25 March	12314D	0933:38		16.0		0.277	57.8	11.0	390
25 March	12321A	2104:44			2.4	0.306	7.8	5.4	220
26 March	12328D	1000:58			12.8	0.260	49.2	10.3	370
26 March	12335A	2131:59			4.1	0.306	13.4	4.6	510
27 March	12341D	0845:24			14.0	0.258	54.3	9.6	470
27 March	12349A	2159:14			3.7	0.310	11.9	6.4	230
28 March	12355D	0910:35			15.8	0.262	60.3	11.1	390
29 March	12369D	0937:55			13.6	0.263	51.6	11.4	320
29 March	12376A	2108:34			3.6	0.310	11.5	6.2	240
30 March	12382D	0820:16			14.9	0.260	57.3	10.6	410
31 March	12396D	0847:35			15.7	0.260	60.3	10.6	430

* The letters A and D indicate ascending and descending satellite passes, respectively.

Electron Content and Equivalent Slab Thickness Evaluated from Faraday Fading Rate

Date (1967)	Revolution Number*	Transverse Position, T_o (GMT)	$\dot{R}$ (rpm)			$\dot{G}$ ($\times 10^{-16}$)	Electron Content ($\times 10^{16}$ elec/m^2)	f_oF2 (MHz)	Slab Thickness, τ (km)
			20 MHz	40 MHz	41 MHz				
1 April	12409D	0729:59			12.5	0.260	48.1	10.7	340
1 April	12417A	2045:26			3.3	0.310	10.6	6.0	240
2 April	12431A	2112:37			4.3	0.312	13.7	6.3	280
3 April	12437D	0824:33			15.2	0.264	57.6	11.8	330
4 April	12450D	0706:59			13.6	0.260	52.3	10.8	360
5 April	12464D	0734:50			17.0	0.261	65.1	11.0	430
6 April	12478D	0801:30			15.4	0.265	58.1	12.0	320
7 April	12491D	0643:57			14.3	0.262	54.6	11.4	340
8 April	12505D	0711:09			14.8	0.260	56.7	10.7	400
9 April	12519D	0738:29			14.1	0.262	53.7	11.3	340
9 April	12526A	1909:20			8.1	0.219	37.0	10.5	270
10 April	12532D	0620:54			12.1	0.258	46.9	10.0	380
11 April	12546D	0648:09			13.0	0.258	50.4	9.9	410
12 April	12567A	1846:15			10.3	0.323	31.9	11.5	190
13 April	12573D	0557:52			12.1	0.259	46.5	10.0	380
15 April	12601D	0652:25			11.6	0.257	45.1	9.5	400
16 April	12614D	0535:45			13.2	0.259	51.0	9.9	420

* The letters A and D indicate ascending and descending satellite passes, respectively.

Electron Content and Equivalent Slab Thickness Evaluated from Faraday Fading Rate

Date (1967)	Revolution Number*	Transverse Position, T_o (GMT)	$\dot{R}$ (rpm)			$\dot{G}$ ($\times 10^{-16}$)	Electron Content ($\times 10^{16}$ elec/m^2)	f_oF2 (MHz)	Slab Thickness, τ (km)
			20 MHz	40 MHz	41 MHz				
16 April	12622A	1849:46			7.7	0.314	24.7	9.5	220
18 April	12642D	0629:22			12.7	0.260	49.0	10.2	380
20 April	12669D	0539:03			13.5	0.262	51.5	10.2	400
20 April	12677A	1853:42			8.8	0.310	28.4	9.0	280
21 April	12683D	0606:20			12.8	0.262	48.9	10.1	390
21 April	12690A	1736:14			12.1	0.314	38.5	11.1	250
22 April	12696D	0448:44			14.3	0.265	54.0	10.9	370
22 April	12704A	1804:29			9.3	0.314	29.6	10.8	200
23 April	12710D	0515:59			16.0	0.266	60.2	11.1	390
24 April	12724D	0543:18			14.5	0.265	54.7	10.2	420
24 April	12731A	1713:07			11.2	0.308	36.4	10.0	290
25 April	12737D	0425:41			12.9	0.267	48.3	10.6	350
26 April	12751D	0452:54			14.2	0.264	53.8	9.9	440
27 April	12765D	0520:15			11.2	0.266	42.2	9.8	350
28 April	12778D	0402:37			12.7	0.266	47.7	9.8	400
29 April	12792D	0429:52			13.8	0.302	45.7	10.0	370

* The letters A and D indicate ascending and descending satellite passes, respectively.

Electron Content and Equivalent Slab Thickness Evaluated from Faraday Fading Rate

Date (1967)	Revolution Number*	Transverse Position, T_o (GMT)	$\dot{R}$ (rps)			$\dot{G}$ ($\times 10^{-16}$)	Electron Content ($\times 10^{16}$ elec/m^2)	f_oF2 (MHz)	Slab Thickness, τ (km)
			20 MHz	40 MHz	41 MHz				
1 May	12819D	0339:33			12.3	0.266	46.2	9.3	430
2 May	12833D	0406:48			11.7	0.269	43.5	9.4	400
3 May	12854A	1603:44			14.7	0.285	51.6	11.8	300
4 May	12860D	0317:07			16.1	0.276	58.3	11.2	380
6 May	12888D	0411:38			10.6	0.274	38.7	9.5	350
7 May	12909A	1607:48			9.6	0.291	33.0	10.4	250
8 May	12915D	0320:39			11.0	0.276	39.8	9.3	370
8 May	12922A	1450:25			6.6	0.277	23.8	9.1	230
9 May	12929D	0347:56			10.8	0.276	39.2	9.4	360
9 May	12936A	1517:33			8.4	0.277	30.3	9.4	280
10 May	12942D	0230:18			8.7	0.268	32.3	8.8	340
10 May	12950A	1544:46			6.3	0.276	22.8	9.1	220
11 May	12956D	0257:30			9.0	0.275	32.7	7.6	460
11 May	12963A	1427:19			4.9	0.282	17.4	8.8	180
12 May	12970D	0324:51			8.6	0.271	31.8	8.5	350
12 May	12977A	1454:24			6.5	0.274	23.7	10.1	190
13 May	12983D	0207:14			8.8	0.281	31.3	9.7	270

* The letters A and D indicate ascending and descending satellite passes, respectively.

Electron Content and Equivalent Slab Thickness Evaluated from Faraday Fading Rate

Date (1967)	Revolution Number*	Transverse Position, T_o (GMT)	$\dot{R}$ (rpm)			$\dot{G}$ ($\times 10^{-16}$)	Electron Content ($\times 10^{16}$ elec/m^2)	f_oF2 (MHz)	Slab Thickness, τ (km)
			20 MHz	40 MHz	41 MHz				
13 May	12991A	1521:31			5.8	0.280	20.8	9.2	200
14 May	12997D	0235:10			10.0	0.272	36.8	8.4	420
14 May	13004A	1404:06			5.2	0.279	18.5	8.5	210
15 May	13011D	0302:27			11.4	0.284	40.2	11.0	320
15 May	13018A	1431:18			6.8	0.281	24.2	9.5	210
16 May	13032A	0144:08			8.3	0.277	29.8	9.1	290
17 May	13038D	0211:18			9.1	0.276	33.0	10.0	270
17 May	13045A	1340:59			12.1	0.268	45.2	9.6	400
18 May	13052D	0239:23			10.1	0.286	35.3	9.4	320
18 May	13059A	1408:11			3.8	0.266	14.2	10.3	110
19 May	13065D	0120:56			8.5	0.288	29.5	9.7	250
19 May	13073A	1435:59			10.0	0.273	36.6	8.0	460
20 May	13086A	1317:52			9.9	0.279	35.5	11.4	220
21 May	13093D	0215:30			9.6	0.292	32.7	10.2	250
21 May	13100A	1345:06			8.1	0.273	29.7	9.3	280
22 May	13106D	0057:50			8.0	0.280	28.6	9.2	270
24 May	13134D	0152:23			8.7	0.294	29.6	9.5	260

* The letters A and D indicate ascending and descending satellite passes, respectively.

Electron Content and Equivalent Slab Thickness Evaluated from Faraday Fading Rate

Date (1967)	Revolution Number*	Transverse Position, T_o (GMT)	$\dot{R}$ (rpm)			$\dot{G}$ ($\times 10^{-16}$)	Electron Content ($\times 10^{16}$ elec/m^2)	f_oF2 (MHz)	Slab Thickness, τ (km)
			20 MHz	40 MHz	41 MHz				
26 May	13163A	1231:42			9.3	0.274	33.8	11.3	210
27 May	13182A	1258:58			7.6	0.268	28.4	9.8	240
28 May	13188D	0011:32			8.4	0.295	28.5	8.2	340
28 May	13196A	1326:25			9.5	0.256	36.9	9.5	330
29 May	13029A	1208:36			10.0	0.266	37.6	10.4	280
30 May	13216D	0106:05			8.0	0.302	26.5	9.5	240
30 May	13223A	1235:47			10.6	0.253	42.0	7.9	540
30 May	13229D	2348:21			5.1	0.293	17.4	7.6	240
31 May	13237A	1302:58			9.3	0.267	34.8	10.9	240

* The letters A and D indicate ascending and descending satellite passes, respectively.

Electron Content and Equivalent Slab Thickness Evaluated from Faraday Fading Rate

Date (1967)	Revolution Number*	Transverse Position, T_o (GMT)	$\dot{R}$ (rpm)			$\dot{G}$ ($\times 10^{-16}$)	Electron Content ($\times 10^{16}$ elec/m^2)	f_oF2 (MHz)	Slab Thickness, τ (km)
			20 MHz	40 MHz	41 MHz				
1 June	13243D	0016:01			8.4	0.305	27.5	9.7	240
11 June	13387A	1105:21			8.5	0.261	32.5	10.3	250
11 June	13393D	2216:23			0.90	0.306	2.9	4.8	100
12 June	13401A	1130:58			8.2	0.257	31.9	9.0	320
13 June	13414A	1013:49			8.3	0.260	31.9	10.5	230
14 June	13428A	1040:18			8.5	0.260	32.7	10.4	240
15 June	13442A	1107:57			8.8	0.257	34.2	9.1	330
16 June	13455A	0950:23			9.5	0.261	36.2	10.6	260
17 June	13469A	1017:11			9.2	0.257	35.8	9.0	360
18 June	13483A	1044:54			10.4	0.259	40.4	10.2	320
19 June	13496A	0926:52			9.4	0.259	36.4	10.1	290
20 June	13510A	0954:03			10.1	0.257	39.2	9.2	370
21 June	13524A	1021:09			9.5	0.257	37.0	9.1	360
22 June	13543D	2016:23			0.93	0.309	3.0	4.6	110
23 June	13551A	0930:45			10.7	0.261	41.0	10.3	310
23 June	13557D	2043:37			2.0	0.311	6.4	6.3	130
24 June	13565A	0958:02			8.6	0.257	33.3	9.2	320

* The letters A and D indicate ascending and descending satellite passes, respectively.

Electron Content and Equivalent Slab Thickness Evaluated from Faraday Fading Rate

Date (1967)	Revolution Number*	Transverse Position, T_o (GMT)	$\dot{R}$ (rpm)			$\dot{G}$ ($\times 10^{-16}$)	Electron Content ($\times 10^{16}$ elec/m^2)	f_oF2 (MHz)	Slab Thickness, τ (km)
			20 MHz	40 MHz	41 MHz				
24 June	13571D	2110:49			4.0	0.307	13.1	3.8	730
25 June	13578A	0840:39			10.4	0.257	40.5	8.8	420
26 June	13592A	0907:45			11.1	0.260	42.6	10.1	340
27 June	13606A	0935:44			12.6	0.260	48.5	9.6	420
28 June	13619A	0817:29			10.3	0.258	39.7	8.5	440
28 June	13625D	1930:03			2.7	0.307	8.8	4.3	380
29 June	13633A	0844:40			9.8	0.260	37.7	9.2	360
29 June	13639D	1957:15			1.3	0.307	4.1	4.3	180
30 June	13646A	0727:06			8.2	0.257	31.9	7.8	420

* The letters A and D indicate ascending and descending satellite passes, respectively.

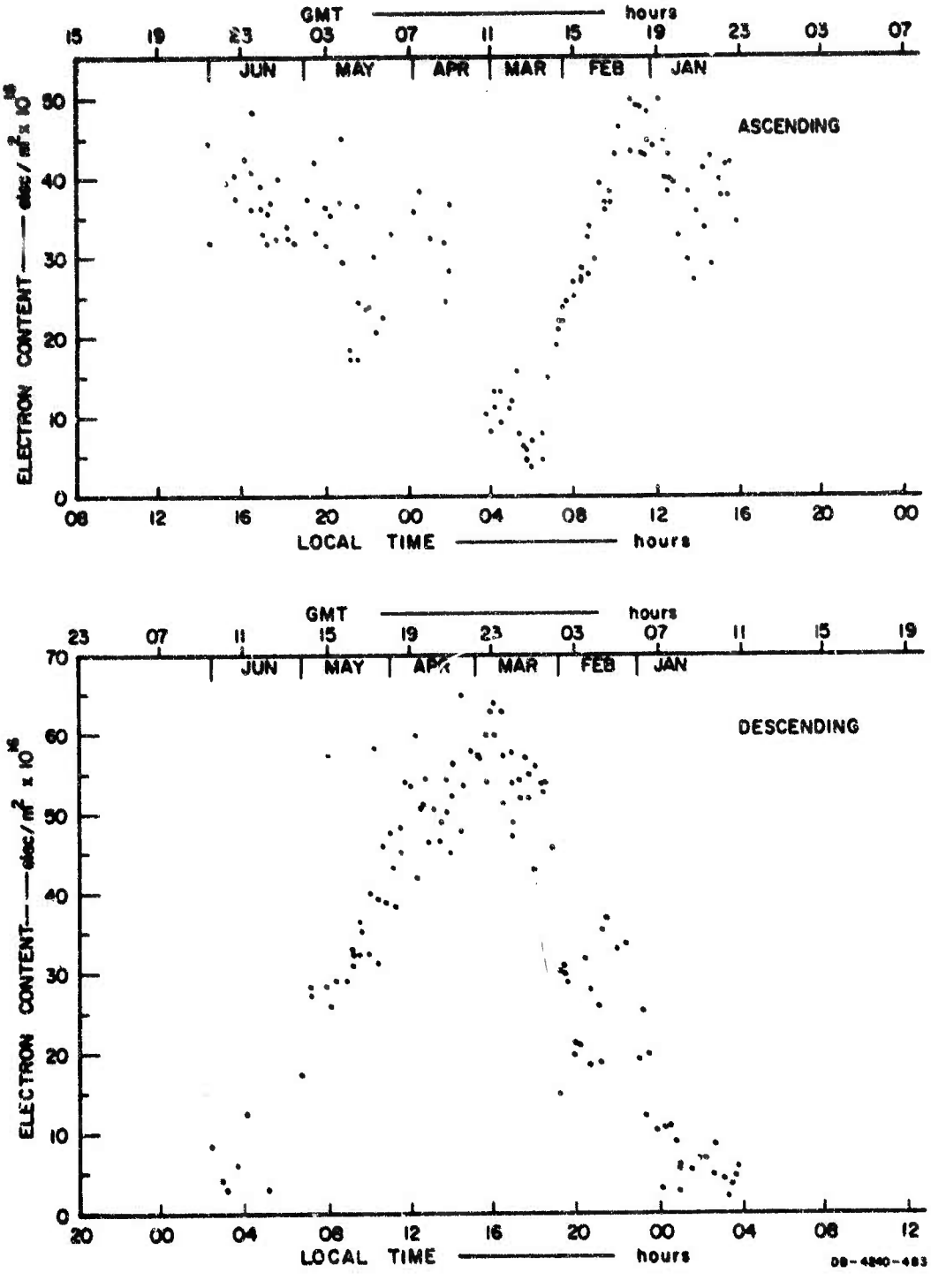

FIG. 1 DIURNAL VARIATION OF ELECTRON CONTENT

REFERENCES

1. S. A. Bowhill, "The Faraday Rotation Rate of a Satellite Radio Signal," J. Atmos. Terrest. Phys., Vol. 13, pp. 175-176 (1958).

2. E. Golton, "Electron Content Observations of the Equatorial Anomaly," paper presented at Second Symposium on Radio Astronomical and Satellite Studies of the Atmosphere, sponsored by Radio Astronomy Branch, Space Physics Laboratory, Air Force Cambridge Research Laboratory, Boston, Massachusetts, pp. 45-48 (October 1965).

3. C. L. Rufenach, V. T. Nimit, and R. E. Leo, "Faraday Rotation Measurements of Electron Content from the Transit IV-A Satellite near the Magnetic Equator," Special Technical Report 14, Contract DA-36-039 AMC-00040(E), SRI Project 4240, Stanford Research Institute, Menlo Park, California.

4. R. V. Bhonsle, A. V. da Rosa, and O. K. Garriott, "Measurements of the Total Electron Content and the Equivalent Slab Thickness of the Midlatitude Ionosphere," J. Research NBS, Radio Science, Vol. 69D, pp. 929-937 (July 1965).

5. V. T. Nimit, "Ionospheric Data, Bangkok, Thailand," Ionospheric Data Report, Contract DA-36-039 AMC-00040(E), ARPA Order No. 5384-PM-63-91, Stanford Research Institute, Menlo Park, California (monthly beginning September 1963).

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	ROLE	WT	ROLE	WT	ROLE	WT
Faraday rotation						
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Ionospheric equivalent slab thickness						
S-66						
Beacon satellite						